

REMARKS

Reconsideration of this application is respectfully requested.

In response to the rejection of claims 1-21 as allegedly being indefinite due to the use of alternative language "antenna elements or sub-arrays", the claims have been amended above so as to eliminate the alternative "or sub-arrays". Of course, it is understood (as reflected in new dependent claims 22 and 23) that subsets of such antenna elements may be group-connected for common control and thus form respectively corresponding sub-arrays.

The Examiner's mention of claim 5 with respect to alternative language is not understood because original claim 5 did not have any alternative language.

In view of this ground of rejection under 35 U.S.C. § 112, second paragraph, the claims have been reviewed and several amendments have been made so as to avoid possible confusion between arrayed antenna elements and the active components and reactively-controlled parasitic components co-located with each other to constitute such elements. It is hoped that this clarification will be found acceptable. If the Examiner wishes some further clarification, the undersigned may be contacted by telephone for prompt resolution of any remaining formality-based issues.

The rejection of claims 1-4, 10, 11, 13 and 16-19 under 35 U.S.C. § 102 as allegedly being anticipated by Black '938 is respectfully traversed. The further rejection of claims 5-9, 12, 14, 15, 20 and 21 under 35 U.S.C. § 103 as allegedly being made "obvious" based on a combination of Black in view of Pickles '943 is also respectfully traversed.

In so far as it has relevance to the present situation, Black is essentially the same as many other cited references (e.g., Himmel '978; Gueguen '799; Henderson '378; Dumas '546; Milne

'197; Taenzer '473; Thiel '638; and Kezys '942). Of course Black itself cites back to the earlier Himmel '978 reference.

Black uses diodes 13 and associated bias circuitry to alternately open-circuit and short-circuit reflector rods A, B and C, D surrounding a single active element K. In this manner, a square wave control voltage 11 causes the radiation pattern of the single active element K to be dithered about a direction finding axis.

Black cannot possibly anticipate applicants' claims for numerous reasons.

First of all, applicants have claimed arrays which require plural antenna elements, each of which must include at least one active component. At best, Black teaches only a single active component in his entire "array".

Secondly, Black does not use a controllably variable reactance load connected to provide reactance-control of a parasitic component co-located with a mated active component of an antenna element in an array of plural such elements. The elements A, B, C, D act as simple reflector elements that are either "on" or "off". This does not amount to a controllably variable reactance load connected to at least one parasitic component that is intimately associated (i.e., co-located) with an active component to provide an antenna element – let alone a plurality of such active/parasitic antenna elements spatially distributed over an array aperture.

In applicants' claimed array, an individual element of an array is built such that it contains an active or driven component as well as at least one reactively-controlled parasitic component that is in close proximity (e.g., in many cases overlapping) the active/driven component. This allows, for example, the individual directivity, frequency tuning, instantaneous bandwidth, polarization and radar cross-section of each array element to be controlled. As a result, in this example, the array directivity, frequency tuning, instantaneous bandwidth,

polarization and radar cross-section can be controlled. Equation 1 in applicants' specification makes this clear.

Applicants' parent application (now U.S. Patent No. 6,876,337) relates to the design of a reactive/parasitically controlled individual antenna element. This CIP application relates to an array of such elements (which may be grouped in subsets to form sub-arrays across the entire aperture).

The asserted combination of Black with Pickles is not understood. It does not seem logical, even with excessive hindsight, to attempt such a combination. To the extent that Pickles '943 teaches the use of parasitic elements, they are parasitic elements that are physically rotated about a stationary central array so as to spatially and frequency modulate VHF RF signals emanating from a stationary terrestrial radio navigating system such as TACAN. While the pair of stationary dipoles 82, 84 at its center might be thought of as a simple form of phased array, there is clearly no control of parasitic components by changing the value of the connected reactance or the like.

Indeed, to the contrary, the parasitic components appear to have fixed characteristics but to be spatially rotated at a predetermined rpm about the central fixed array of active elements. Furthermore, the parasitic components do not appear to be closely associated or co-located with respectively corresponding active or driven elements. Instead, the parasitic elements appear to be identifiable separate elements that interact over the entire array aperture in a collective fashion rather than being individually associated with a respectively corresponding active/driven component.

Neither of the cited references teach or suggest variable reactance circuits such as a varactor (e.g., applicants' claim 7) or parasitic components that are controlled by the use of a

feedback control system that adjusts RF properties of the parasitic components based on an observed metric (e.g., applicants' claim 8). Nor is there any suggestion of an array controller that is configured and connected to control (a) RF/electrical properties of a parasitic component and (b) the phase of an associated antenna active component so as to achieve control over at least an array beam pointing angle (e.g., see applicants' claims 13-15). None of the cited references teach a digital beamformer circuit from which information is extracted to at least assist and control a parasitic component (e.g., see applicants' claims 16-21).

In short, even if the Examiner's suggestion is assumed *arguendo*, replacing the Black monopole with one or more dipoles (even if considered to be a form of phased array) would not result in applicants' claimed invention. Nor would such a structure appear to be consistent with the teachings of Black (let alone the teachings of Pickles).

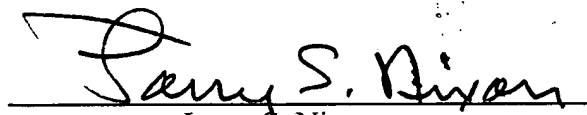
There is no suggestion in either of these references for making this allegedly "obvious" piece-meal and selective reconstruction of either reference.

Accordingly, this entire application is now believed to be in allowable condition and a formal notice to that effect is respectfully solicited.

Respectfully submitted,

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